ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

MEMORANDUM

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Kane County / Woodland

APR 5 1978

E.P.A. – D.L.P.C.
STATE OF ILLINOIS

DATE: March 29, 1978

TO: Division File

FROM: Bob Koch, Northern Region Water Monitoring Program BAK

SUBJECT: Results of Groundwater Pollution Investigation at S. Elgin/Woodland Landfill

On February 7 and 8, 1978, I visited the subject site for the purpose of obtaining comprehensive groundwater and surface water samples in order to detect any existing water contamination and to determine potential for future pollution resulting from the solid waste disposal operation. This sampling was performed through the Regional Water Quality Monitoring Program at the request of Joe Petrilli, Regional Manager, and Dave Beno of the U.S. Army Corps of Engineers. The Corps is involved because the landfill and adjecent area is under consideration as a designated wetland, thus falling under the Corp's jurisdiction via the Federal Water Pollution Control Act of 1972.

Samples were taken in the locations designated on the attached map. Eleven points were sampled, including four monitor wells, two groundwater springs, and five surface stream samples: one upstream of the site, three mid-site, and one downstream. Samples were obtained according to standard procedures as set up for the Regional Water Monitoring Program.

Results indicate that groundwater standards for iron (Fe) and manganese (Mn) are consistently exceeded for all groundwater samples obtained, both springs and wells. Comparison of Fe and Mn levels for G102, G103, G104 and G301 indicate that a naturally high level for these parameters exists. However, levels for these parameters is significantly higher in G101 (MW-1), the well immediately adjacent to the previously filled area # 1. In addition, parameters for zinc, ROE (TDS), sulfate, and especially lead exceed groundwater standards while the other groundwater monitor points do not. Increased hardness (as $CaCO_3$) found here further indicates active ion exchange is occurring in response to leachate movement through the calcareous tills and sands found on site. Therefore, we must assume that leachate is traveling with groundwater that discharges into the bog area just southeast of fill area #1. This would correspond to expected direction of groundwater movement, that is, to the southeast.

Comparison of upstream, midsite, and downstream surface water samples show no apparent significant degradation of water quality as yet. Although TDS is some 35% higher downstream of the site than upstream, a large part of this may be attributable to natural highly mineralized groundwater discharge. Increased ammonia levels are probably due to decomposition of vegetable matter within the reducing environment of the adjacent peat bog. Certainly some portion of these and other parameters that show increased levels downstream may be due to leachate. If contaminated groundwater as found in MW-1 (G101) continues to discharge into the bog, it will be only a matter of time before such contamination becomes obvious in midsite and downstream surface water. Future increases in indicator parameters such as boron, iron, chloride, manganese, hardness, and TDS should indicate whether or not this is occurring. These will be observed closely in the future.

Sample L101 was from what appeared to be a leachate spring flowing into a pond on the east side of the bog east of the landfill. (See map location.) Although the occurrence of natural"leachate" known as ochre red (a bright orange-red ferric iron precipitate formed when iron-bearing buried Pleistocene organic material decomposes, leaches into groundwater, and oxidizes upon exposure to air) is commonly found in areas of glacial outwash gravels, the presence of abnormally high levels of certain indicator parameters indicates that the liquid sampled in this case was indeed a landfill leachate, and is not a natural phenomenon. Boron, one of the most reliable leachate indicators, (Piskin and Clark, 1977) is 50% higher than in any other groundwater samples. Likewise, the presence of abnormally high levels of iron, barium, COD, ROE, and the mere presence of oil and phenolics all point to groundwater contamination from landfill wastes.

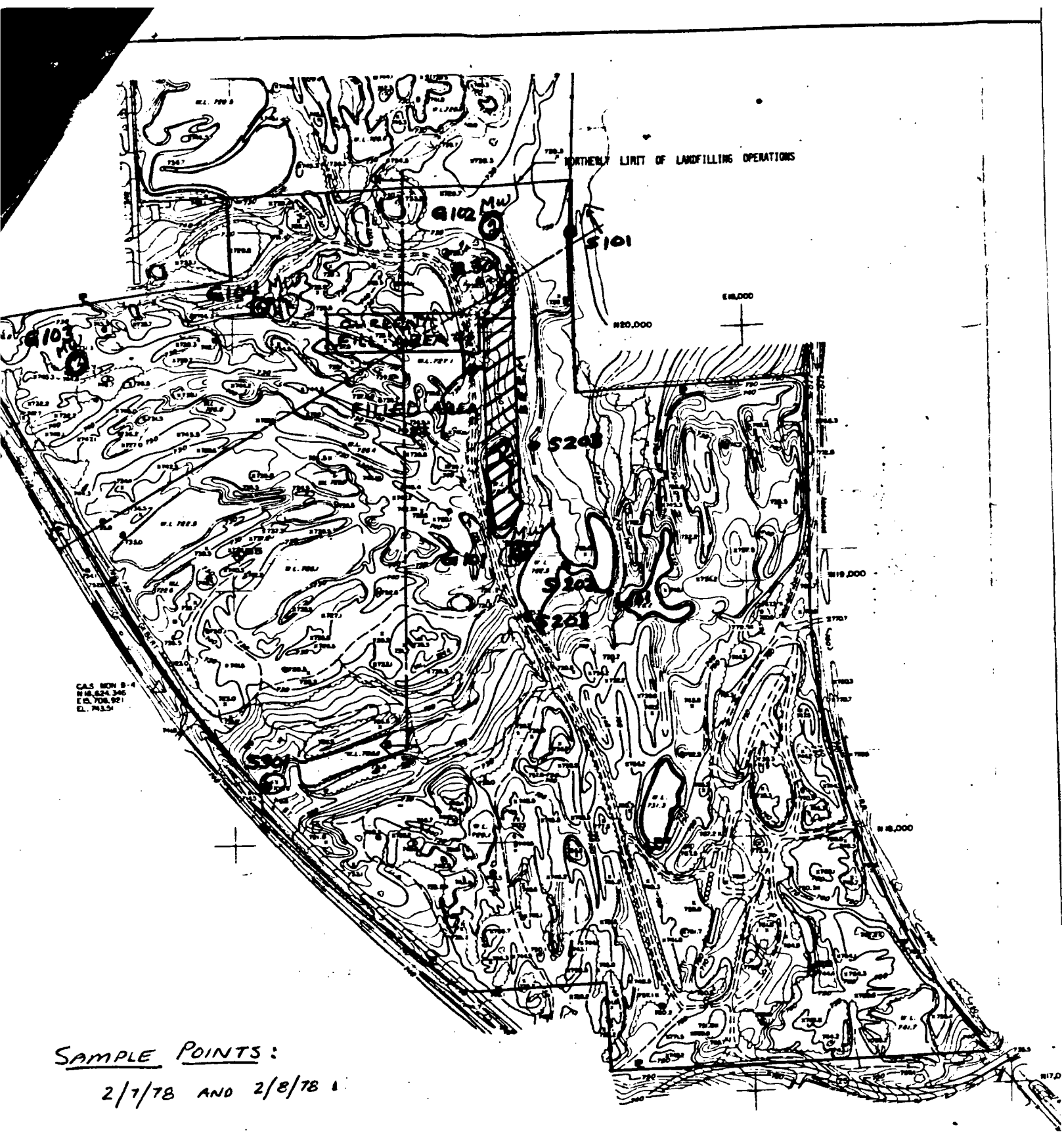
The exact source of this contamination is something of a mystery. It is probably not attributable to the Woodland Landfill, due to the relatively young age of that fill, its distance from the leachate spring, and the fact that the spring occurs on the opposite side of the bog from the fill area. It is much more plausible that leachate could have migrated through disturbed gravel deposits from the old Tri-County Landfill site about 800' to the east. The point at which the leachate spring occurs is the lowest elevation adjacent to that site, so this is where we could expect a leachate spring to occur, if at all.

Further tests will be run on this spring and the other groundwater monitoring points to further corroborate or refute these initial findings. It should be noted that these analyses were run on unfiltered water samples, so some parameters may reflect higher levels than actually present in groundwater due to the dissolving of some minerals from suspended solids in the sample by acid preservatives.

Reference Cited

Clark, Thomas and Piskin, Rauf,"Chemical Quality and Indicator Parameters for Monitoring Landfill Leachate in Illinois" in Environmental Geology, Vol.1, pp 329-339, 1977.

RAK:rak
cc: Joe Petrilli
Wm. C. Child



SAMPLE POINTS:

2/7/78 AND 2/8/78

SCALE:

SOUTH ELGIN/
WOODLAND LANDFILL

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